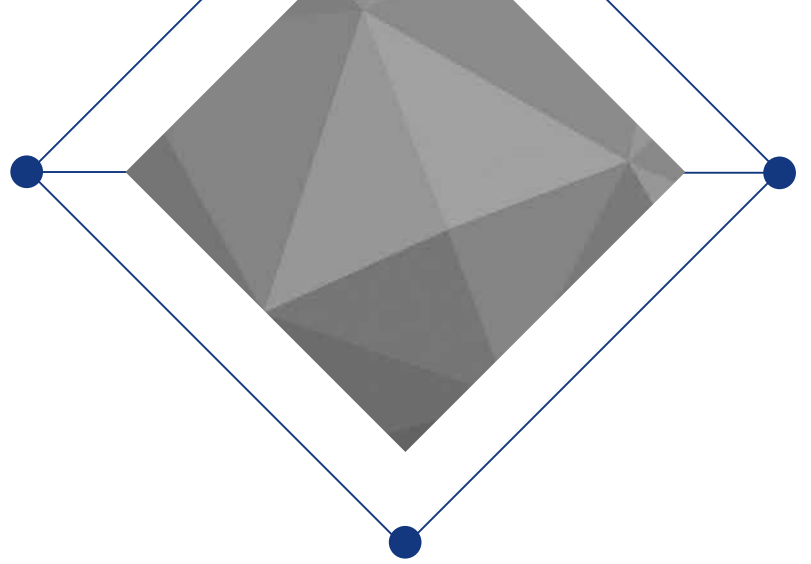




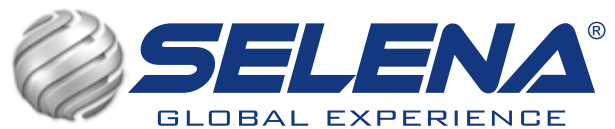
Issuance date: 30.08.2018
Validity date: 30.08.2023



BITUMINOUS MEMBRANES

Type TACK-R, COOL-R
and SELENA MOST ROAD-R

ITB-EPD No 074/2018



EPD Program Operator:

Instytut Techniki Budowlanej (ITB)

Address: Filtrowa 1, 00-611 Warsaw, Poland

Website: www.itb.pl

Contact: Justyna Tomaszewska j.tomaszewska@itb.pl
energia@itb.pl

Owner of the EPD:

Selena FM S.A.

Address: Strzegomska 2-4, 53-611 Wroclaw, Poland

Website: www.selena.com/pl/

Tel.: [+48] 71 78 38 290

Fax.: [+48] 71 78 38 291

Contact: office@selena.pl

ITB is the verified member of The European Platform for EPD program operators and LCA practitioner www.eco-platform.org

Basic information

This declaration is the type III Environmental Product Declaration (EPD) based on EN 15804 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment. Their aspects were verified by the independent body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).

Life cycle analysis (LCA): A1-A3 modules in accordance with EN 15804 (Cradle to Gate)

The year of preparing the EPD: 2018

Product standard: EN 13707, EN 13969

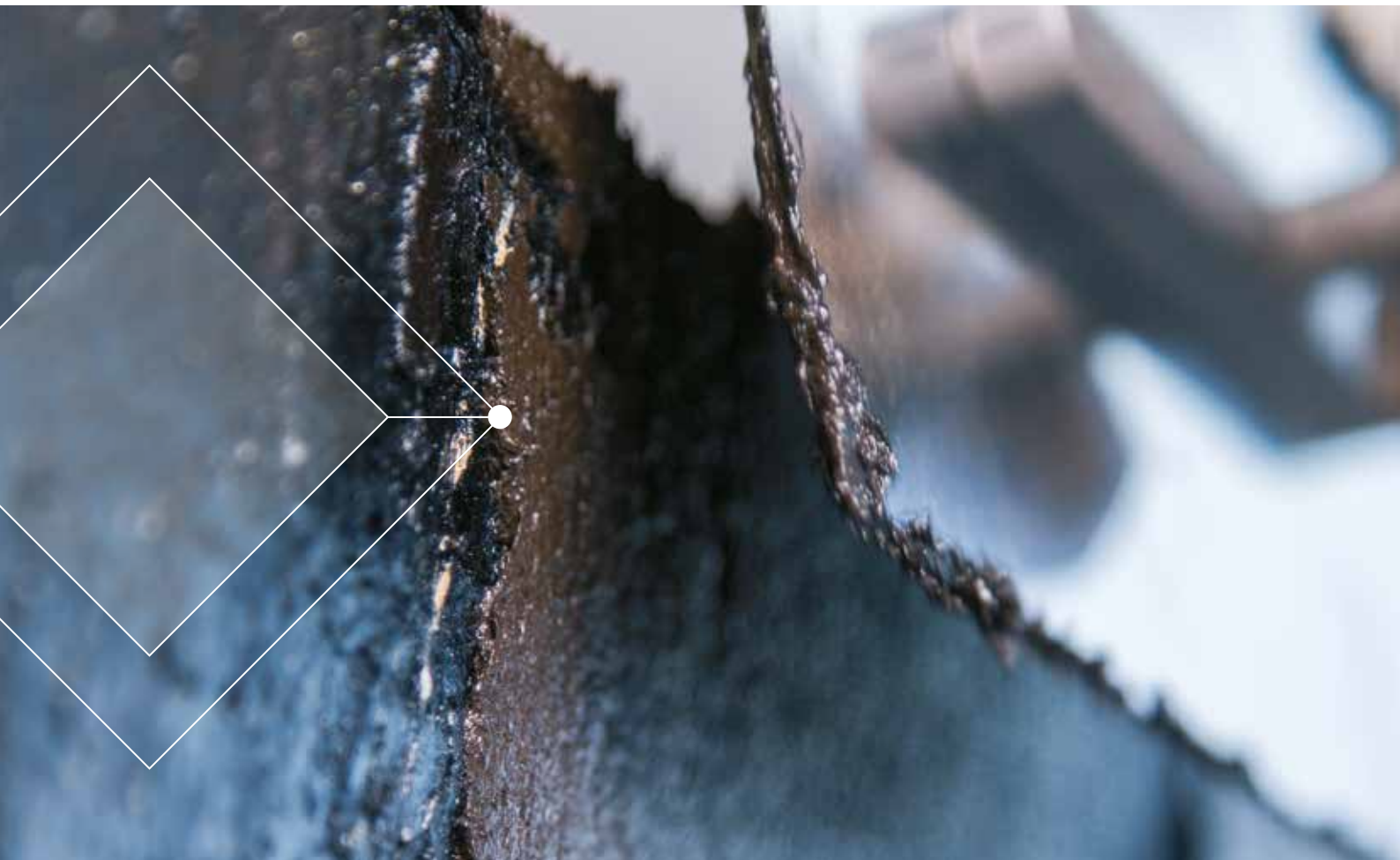
Service Life: 10 years for standard product

PCR: ITB-PCR A (PCR based on EN 15804)

Declared unit: 1 m²

Reasons for performing LCA: B2B

Representativeness: Polish product



MANUFACTURER AND PRODUCT INFORMATION

Selena Group is a global manufacturer and distributor of a wide range of construction chemicals for professional contractors and home users. The Group comprises 30 subsidiary companies and manufacturing plants which produce polyurethane foams, sealants, adhesives, ETICS components and waterproofing materials.

Established in 1992, Selena was offering modern construction chemicals on the Polish market. Today, Selena Group employs more than 1700 people and is among manufacturers of one-component polyurethane foam in the world. Our effective distribution network covering Europe, Asia, North & South America reaches 42 000 customers and millions of end-users all over the world. Thanks to an integrated research & development function with laboratories in Poland, Spain, Turkey and China, Selena invests in innovative solutions that change the way we build for the better, and continuously expands its product portfolio.

The global experience gained in diverse local markets allows the Selena Group to develop fast and to create solutions tailored to the needs of the users. Manufacturing plants located in Poland, Spain,



Fig. 1. The view of Selena FM S.A. in Wrocław.

China, South Korea, Brazil, Turkey, Romania and Kazakhstan cater to the growing demand for Selena products.

Product description

Bituminous membranes TACK-R, COOL-R and SELENA MOST ROAD-R are produced in IZOLACJE MATIZOL S.A. factory in Gorlice (Poland). They are designed for roof covering and / or waterproofing. Manufactured in accordance with EN 13 707 and / or EN 13969. They have factory production control certificates No. 1434-CPR-0194 and 1434-CPR-0195.

The bituminous membranes are built in layers. From the top there are:

- protection of the top surface (usually mineral slate or sand)
- bituminous mix (bitumen, mineral filler, modifiers)
- insert carrier (polyester, glass fiber tissue, woven glass, cardboard)
- bituminous mix
- protection of the bottom surface (PE film)



Fig. 2. The view of bituminous membrane TACK-R produced by IZOLACJA – MATIZOL S.A.

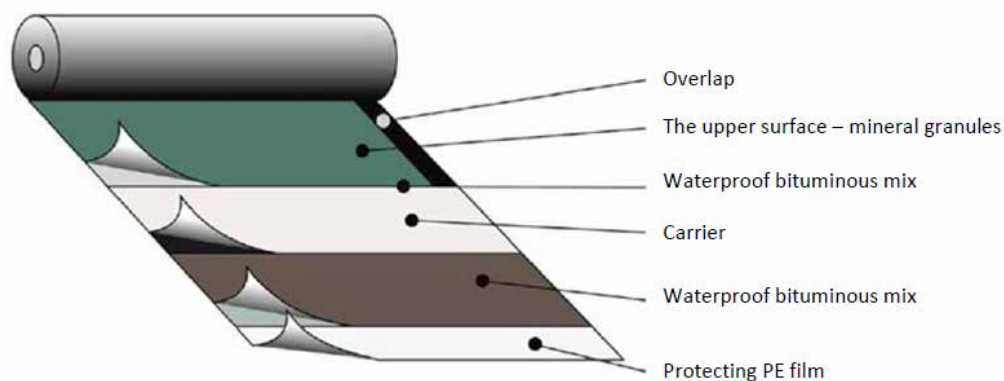


Fig. 3. The scheme of bituminous membrane produced by IZOLACJA – MATIZOL S.A.

TYTAN TACK-R membranes

application: for new and renovation roofs, flat and slope, parking and foundation,

Products according with:

PN-EN 13707+A2:2012 Flexible sheets for waterproofing. Reinforced bitumen sheets for roof waterproofing. Definitions and characteristics.

EN 13969:2004, EN 13969:2004/A1:2006 Flexible products for waterproofing. Asphalt products for damp insulation including asphalt products for waterproofing of underground elements. - Definitions and properties.

COOL-R membranes

application: for new and renovation roofs, flat and slope.

Products according with:

PN-EN 13707+A2:2012 Flexible sheets for waterproofing. Reinforced bitumen sheets for roof waterproofing. Definitions and characteristics.

COOL-R TT20 S30 and COOL-R FIX S50 is top layer, mechanically fixed or weldable bitumen membrane on the polyester fabric for COOL-R „Cool Roof” system. It is the top layer in double-layer waterproofing system under polymer substance COOL-R.

SELENA MOST ROAD-R T20 S50

application: SELENA MOST ROAD-R T20 S50 is top, single layer, weldable membrane on the polyester fabric for heavy waterproofing on bridges and roads. It should be use in single- and multilayer systems on all concrete surfaces for vehicular traffic; including on the areas of car parks, garages and other parts of underground facilities.

Products according with:

Technical approval IBDiM nr AT/2006-02-1987/4

Table 1. Technical parameters of bituminous membranes type TACK-R, COOL-R, SELENA MOST ROAD-R produced by IZOLACJA – MATIZOL S.A.

Product	Parameters			
	Elasticity at low temperature	Tensile strength - longitudinal direction - transverse direction	Elongation - longitudinal direction - transverse direction	Watertightness
TACK-R TU15 S30	≤ - 15°C	(800 ± 250) N/50mm (650 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	100 kPa
TACK-R TU20 S30	≤ - 20°C	(800 ± 250) N/50mm (650 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	150 kPa
TACK-R TU15 S40	≤ - 15°C	(900 ± 250) N/50mm (700 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	150 kPa
TACK-R TU20 S40	≤ - 20°C	(900 ± 250) N/50mm (700 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	150 kPa
TACK-R TU05 S30	≤ - 5°C	(800 ± 250) N/50mm (650 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	100 kPa
TACK-R FIX15 S27	≤ - 15°C	(800 ± 250) N/50mm (650 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	100 kPa
TACK-R FIX20 S27	≤ - 15°C	(800 ± 250) N/50mm (650 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	100 kPa
TACK-R PYE PV250 S40	≤ - 5°C	(800 ± 250) N/50mm (650 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	10 kPa
TACK-R G200 S40	≤ - 5°C	(1200 ± 250) N/50mm (2500 ± 250) N/50mm	(10 ± 15) % (10 ± 15) %	10 kPa
TACK-R G200 S40 EXTRA	≤ - 15°C	(1200 ± 250) N/50mm (2500 ± 250) N/50mm	(10 ± 15) % (10 ± 15) %	10 kPa
TACK-R TT20 S40	≤ - 20°C	(800 ± 250) N/50mm (650 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	150 kPa
TACK-R TT15 S50	≤ - 15°C	(900 ± 250) N/50mm (700 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	100 kPa
TACK-R TT20 S52	≤ - 20°C	(900 ± 250) N/50mm (700 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	100 kPa
TACK-R PYE PV250 S52	≤ - 5°C	(800 ± 250) N/50mm (650 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	10 kPa
TACK-R ONE TT20 S50	≤ - 20°C	(1100 ± 250) N/50mm (850 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	150 kPa
TACK-R GREEN S40	≤ - 20°C	(900 ± 250) N/50mm (700 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	100 kPa
TACK-R GREEN S52	≤ - 25°C	(1000 ± 250) N/50mm (800 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	150 kPa
TACK-R ALU S30	≤ - 15°C	(450 ± 250) N/50mm (350 ± 250) N/50mm	(5 ± 3) % (5 ± 3) %	10 kPa
TACK-R ALU S40	≤ - 15°C	(450 ± 250) N/50mm (350 ± 250) N/50mm	(5 ± 3) % (5 ± 3) %	10 kPa
TACK-R ALU S26	≤ - 20°C	(450 ± 250) N/50mm (350 ± 250) N/50mm	(5 ± 3) % (5 ± 3) %	10 kPa
TACK-R ST25 S50	≤ - 25°C	(1100 ± 250) N/50mm (850 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	150 kPa
TACK-R SU20 S25	≤ - 20°C	(900 ± 250) N/50mm (700 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	150 kPa
TACK-R TF10 S32	≤ - 10°C	(1000 ± 250) N/50mm (700 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	100 kPa
TACK-R SF20 S25	≤ - 20°C	(800 ± 250) N/50mm (600 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	100 kPa
SELENA MOST ROAD-R T20 S50	≤ - 20°C	(1000 ± 250) N/50mm (800 ± 250) N/50mm	(40 ± 15) % (45 ± 15) %	---
COOL-R TT20 S30	≤ - 20°C	(800 ± 250) N/50mm (650 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	100 kPa
COOL-R FIX S50	≤ - 20°C	(900 ± 250) N/50mm (700 ± 250) N/50mm	(50 ± 15) % (50 ± 15) %	150 kPa



Table 2. Range of products belonging to the group of bituminous membranes type TACK-R, COOL-R, SELENA MOST ROAD-R produced by IZOLACJA – MATIZOL S.A

PRODUCT NAME	Intended use	Dimensions: thickness, mm/ length, m	Top surface	Bottom surface
TACK-R TU15 S30	Undercoat layer	3/10	PE foil	PE foil
TACK-R TU20 S30	Undercoat layer	3/10	PE foil	PE foil
TACK-R TU15 S40	Undercoat layer	4/7,5	Sand	PE foil
TACK-R TU20 S40	Undercoat layer	4/7,5	Sand	PE foil
TACK-R TU05 S30	Undercoat layer	3/10	Sand	PE foil
TACK-R FIX15 S27	Undercoat layer	2,7/10	PE foil	PE foil
TACK-R FIX20 S27	Undercoat layer	2,7/10	PE foil	PE foil
TACK-R PYE PV250 S40	Undercoat layer	4/7,5	Sand	PE foil
TACK-R G200 S40	Undercoat layer	4/7,5	Sand	PE foil
TACK-R G200 S40 EXTRA	Undercoat layer	4/7,5	Sand	PE foil
TACK-R TT20 S40	The top layer	4/7,5	Mineral slate	PE foil
TACK-R TT15 S50	The top layer	5/5	Mineral slate	PE foil
TACK-R TT20 S52	The top layer	5,2/5	Mineral slate	PE foil
TACK-R PYE PV250 S52	The top layer	5,2/5	Mineral slate	PE foil
TACK-R ONE TT20 S50	Single-layer or top layer	5/5	Mineral slate	PE foil
TACK-R GREEN S40	Root barrier	4/7,5	Mineral slate	PE foil
TACK-R GREEN S52	Root barrier	5,2/5	Mineral slate	PE foil
TACK-R ALU S30	Vapor barrier	3/10	Sand	PE foil
TACK-R ALU S40	Vapor barrier	4/7,5	Sand	PE foil
TACK-R ALU S26	Vapor barrier	2,6/10	Sand	PE foil
COOL-R FIX S50	COOL-R system	5/5	Polyester	PE foil
COOL-R TT20 S30	COOL-R system	3/10	Polyester	PE foil
TACK-R ST25 S50	Self-adhesive system	5/5	Mineral slate	PE foil
TACK-R SU20 S25	Self-adhesive system	2,5/10	Sand	PE foil
TACK-R TF10 S32	Water proofing	3,2/10	PE foil	PE foil
TACK-R SF20 S25	Water proofing	2,5/10	Polyester	PE foil
SELENA MOST ROAD-R T20 S50	Road water proofing	5/8	Mineral slate	PE foil

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of the bituminous membranes type TACK-R, COOL-R and SELENA MOST ROAD-R is a line process in one factory of IZOLACJA MATIZOL S.A. in Gorlice (Poland). Allocation was done on product mass basis. All impacts from raw materials extraction are allocated in A1 module of the EPD. 3.97% of impacts from line production of IZOLACJA MATIZOL S.A. were inventoried and allocated to bituminous membranes TACK-R, COOL-R and SELENA MOST ROAD-R production. Municipal waste and waste water of whole factory were allocated to module A3. Energy supply was inventoried for whole production process. Emissions in the factory are measured and were allocated to module A3.

System limits

The life cycle analysis of the declared products covers "Product Stage", A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB PCR A. The details of systems limits are provided in product technical report. All materials and energy consumption inventoried in factory were included in calculation. Office impacts were also taken into consideration. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilised thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A1, machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

A1 and A2 Modules: Raw materials supply and transport

Raw materials such as bitumen, SBS, CaCO₃, feldspar, sand, PE, additives (biocide) and packaging materials (PE foil, shrinking hoods, pallets) come from Polish and foreign suppliers. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include trucks and Polish and European fuel averages are applied.

A3: Production

The production scheme is presented in Fig. 3.

Data collection period

The data for manufacture of the declared products refer to period between 01.1.2016 - 31.12.2016 (1 year). The life cycle assessments were prepared for Poland as reference area.

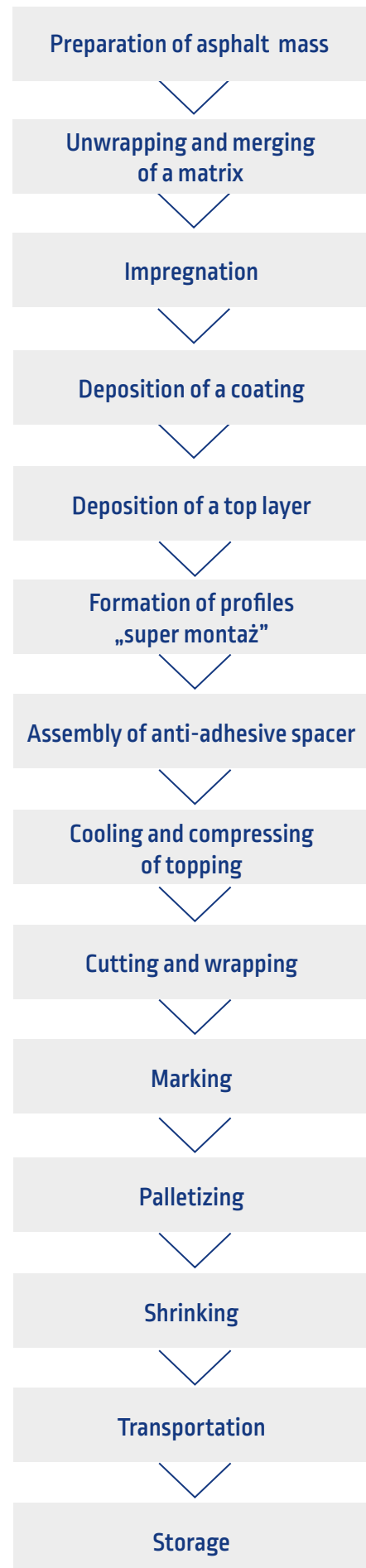


Fig. 3. The production scheme.

Data quality

The values determined to calculate the LCA originate from verified IZOLACJA – MATIZOL S.A. inventory data.

Assumptions and estimates

The impacts of the representative of the bituminous membranes type TACK-R, COOL-R and SELENA MOST ROAD-R were aggregated using weighted average. Impacts were inventoried and calculated for all products of the bituminous membranes type TACK-R, COOL-R and SELENA MOST ROAD-R.

Calculation rules

LCA was done in accordance with ITB PCR A document.

Databases

The data for the processes come from the following databases: Ecoinvent, specific EPDs, Ullmann's, ITB-Data. Specific data quality analysis was a part of external ISO 14001 audit. Characterization factors are CML ver. 4.2 based on EN 15804:2013+A1 version (PN-EN 15804+A1:2014-04).

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to functional unit (FU) – 1 m² of the bituminous membranes type TACK-R, COOL-R and SELENA MOST ROAD-R produced by IZOLACJA - MATIZOL S.A.

Table 3. System boundaries for environmental characteristic of bituminous membranes type TACK-R, COOL-R and SELENA MOST ROAD-R

Environmental assessment information (MNA – Module not assessed, MD – Module Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

Bituminous membranes type TACK-R, COOL-R and SELENA MOST ROAD-R

Environmental impacts: (FU) 1 m²

Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	1,48E+00	3,46E-01	3,60E-01	2,19E+00
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,76E-07	0,00E+00	0,00E+00	2,76E-07
Acidification potential of soil and water	[kg SO ₂ eq.]	7,46E-01	7,28E-04	1,31E-12	7,46E-01
Formation potential of tropospheric ozone	[kg Ethene eq.]	1,19E-01	1,38E-04	0,00E+00	1,19E-01
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	3,14E-01	5,66E-05	2,43E-13	3,15E-01
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4,43E-04	0,00E+00	1,33E-06	4,44E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	6,18E+01	2,33E-03	1,96E-01	6,20E+01

Environmental aspects on resource use: (FU) 1 m²

Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	7,49E-01	1,04E-01	1,69E+02	1,70E+02
Use of renewable primary energy resources used as raw materials	[MJ]	3,76E+00	0,00E+00	0,00E+00	3,76E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	4,63E+00	1,04E-01	1,69E+02	1,74E+02
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	6,77E+01	2,45E-03	2,06E-01	6,79E+01
Use of secondary material	[kg]	1,42E+00	0,00E+00	3,74E-07	1,42E+00
Use of renewable secondary fuels	[MJ]	1,62E-05	0,00E+00	0,00E+00	1,62E-05
Use of non-renewable secondary fuels	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water	[dm ³]	3,12E-02	1,38E-13	5,18E-05	3,13E-02

Other environmental information describing waste categories: (FU) 1 m²

Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	7,67E-01	1,47E-05	5,62E-10	7,67E-01
Non-hazardous waste disposed	[kg]	2,42E+00	1,36E-02	1,10E-07	2,43E+00
Radioactive waste disposed	[kg]	3,51E-04	0,00E+00	0,00E+00	3,51E-04
Components for re-use	[kg]	2,21E-03	0,00E+00	3,74E-10	2,21E-03
Materials for recycling	[kg]	6,48E-04	0,00E+00	1,22E-07	6,48E-04
Materials for energy recover	[kg]	2,22E-04	0,00E+00	4,21E-09	2,22E-04
Exported energy	[MJ per energy carrier]	INA	INA	INA	INA

Verification

The process of verification of this EPD is in accordance with ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A

Independent verification corresponding to ISO 14025 (subclause 8.1.3.)

external

internal

External verification of EPD: Ph.D. Eng. Halina Prejzner

LCA, LCI audit and input data verification: Ph.D. Eng. Justyna Tomaszewska, j.tomaszewska@itb.pl

Verification of LCA: Ph.D. Eng. Michał Piasecki, m.piasecki@itb.pl

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- PN-EN 13707:2013-12 Flexible sheets for waterproofing -- Reinforced bitumen sheets for roof waterproofing -- Definitions and characteristics
- PN-EN 13969:2006 Flexible sheets for waterproofing - Bitumen damp proof sheets including bitumen basement tanking sheets - Definitions and characteristics
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations
- – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011, Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15804:2012+A1:2013 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- KOBiZE Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej, grudzień 2017





Instytut Techniki Budowlanej

00-611 Warsaw, Filtrowa 1

Thermal Physics, Acoustics and Environment Department

02-656 Warsaw, Ksawerów 21

CERTIFICATE № 074/2018 of TYPE III ENVIRONMENTAL DECLARATION

Product:

**Bituminous membranes
type TACK-R, COOL-R and SELENA MOST ROAD-R**

Manufacturer:

Selena FM S.A.

Strzegomska 2-4, 53-611 Wrocław, Poland

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

PN-EN 15804+A1:2014-04

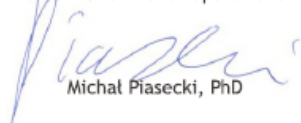
Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued for the first time on 30th August 2018 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physics, Acoustics
and Environment Department


Michał Piasecki, PhD



Deputy Director
for Research and Innovation


Krzysztof Kuczyński, PhD

Warsaw, August 2018



WATCH
SELENA VIDEO:



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www.selena.com



Issuance date: 30.08.2018
Validity date: 30.08.2023



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